Arizona Clean Fuels Yuma, LLC
Permit Number: 1001205
Petroleum Refinery
Responsiveness Summary to Public Comments

INTRODUCTION

The proposed Arizona Clean Fuels Yuma refinery will be located on an approximately 1,450-acre site, 40 miles east of Yuma, near the Community of Tacna, in Yuma County. The proposed refinery will have a crude oil atmospheric distillation capacity of approximately 150,000 barrels per day (BPD). It is expected to produce approximately 150,000 BPD of motor fuels, including approximately 85,000 BPD of motor gasoline; 35,000 BPD of diesel fuel; and 30,000 BPD of jet fuel. In addition to motor fuels, the refinery will produce liquefied petroleum gas (LPG), sulfur, and petroleum coke.

The site of the proposed refinery is located in a "clean air area" – one that has been designated as attainment or unclassifiable for all criteria pollutants under the Clean Air Act. The criteria pollutants are particulate matter less than 10 microns (PM_{10}), nitrogen dioxide (NO_2), sulfur oxides (SO_x), carbon monoxide (CO), lead (Pb), and ozone (O_3). The design of the proposed refinery incorporates state-of-the-art technologies for reducing air emissions. Per unit of product, the allowable emissions from the proposed Arizona Clean Fuels refinery would be significantly less than the actual emissions from any other existing petroleum refinery.

If constructed, this project would represent the first new petroleum refinery constructed in the U.S. in more than 30 years and the first facility in the western U.S. to be built specifically for the production of newer clean fuels. It would be the only petroleum refinery in Arizona, and the only large refinery between Texas and California. Several specialized commercial technologies are to be incorporated in the refinery process units to reduce fuel aromatics and sulfur, which in turn reduces emissions from vehicles.

PROCESS DESCRIPTION

The proposed petroleum refinery would operate 24 hours a day and 365 days a year. Primary raw materials for the refinery are crude oil and natural gasoline. These materials would be delivered to the refinery primarily via a pipeline. Other raw materials include butane, propane, alkylate, and oxygenates, which would be delivered to the refinery via rail, and natural gas, which would be received by pipeline.

Motor fuels would be shipped from the refinery by pipeline, rail, and truck. In addition to motor fuels, the refinery would produce liquefied petroleum gas (LPG), sulfur, and petroleum coke, all of which would be shipped by rail.

The proposed petroleum refinery's major process units would include a Crude Distillation Unit, a Delayed Coking Unit, a Hydrocracker Unit, a Naphtha Hydrotreater Unit, a Distillate Hydrotreater Unit, a Catalytic Reforming Unit, a Butane Conversion Unit, a Benzene Reduction Unit, and an Isomerization Unit. Supporting process units would include a Gas Concentration Plant, a Hydrogen Plant, a Sulfur Recovery Plant, an Amine Regeneration Unit, a Sour Water

Stripper, and a Wastewater Treatment Plant. Ancillary equipment would include storage tanks, loading and unloading racks, emergency flares, steam boilers, a cooling tower, an emergency generator, and two emergency fire water pumps.

BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

As required by the PSD rule under Article 4 of A.A.C. Title 18, Chapter 2, the Department made determinations of BACT for each emission unit at the refinery and for each pollutant emitted. The process used by the Department in making its BACT determinations starts with a review of the control measures used by other similar sources, including other petroleum refineries nationwide. The Department then establishes emission limits based on the maximum achievable degree of emission reduction, taking into account technical feasibility, environmental impacts, economic impacts, energy impacts, and other costs. In the case of the Arizona Clean Fuels refinery, the Department's BACT determinations would ensure that this would be, by far, the lowest-emitting, fully integrated petroleum refinery in the U.S.

The air quality permit includes requirements for numerous, state-of-the-art emission control measures that are exceptionally stringent relative to the air quality permits for most petroleum refineries. A full discussion of the emission control measures can be found in Section V of the Technical Support Documents. Examples of these measures include the following:

- The refinery design does not include a fluidized catalytic cracking unit, and the permit does not allow the construction of such unit. Nearly all other petroleum refineries include a fluidized catalytic cracking unit, and this unit is generally the largest-emitting unit at a refinery. The Arizona Clean Fuels petroleum refinery would accomplish the same refining objectives using other technologies, most notably a Hydrocracker Unit.
- The refinery design does not include any alkylation processes that require the use of hydrofluoric acid or sulfuric acid as catalysts, and the permit does not allow the construction of such processes. Most other petroleum refineries include these types of alkylation processes, which are potential sources of toxic chemical releases. The Arizona Clean Fuels petroleum refinery would accomplish the same refining objectives using other technologies, most notably the Butane Conversion Unit.
- The permit prohibits the use of flares as pollution control devices for intermittent or routine, non-emergency hydrocarbon releases. Most other petroleum refineries do currently use elevated flares for this purpose. This commonly results in visible exposed flames, excessive VOC and CO emissions, and difficulty in monitoring and tracking air pollutant emissions. As with all petroleum refineries, the Arizona Clean Fuels refinery would include flares for the safe disposal of gases released during emergencies.
- The permit prohibits the combustion of fuel oil in the refinery's boilers and heaters. Natural gas and fuel gases generated within the refinery are the only fuels allowed. Most petroleum refineries do burn fuel oil, which results in higher emissions of several air pollutants.
- The permit requires highly efficient removal of sulfur from fuel gas burned in the refinery's process heaters, so that the sulfur concentration is maintained at or below 35 parts per million by volume. This would be nearly 80 percent lower than the applicable emission standards for most other petroleum refineries, and the Department is not aware of any other petroleum refinery that is required to achieve a limit that is this stringent.

- The permit requires the use of ultra-low-NO_X burners (ULNB) for control of NO_x emissions from all boilers and heaters. Nearly all petroleum refineries have at least some boilers and heaters that are not so equipped.
- The permit requires the use of selective catalytic reduction (SCR), in addition to ULNB, for control of nearly three-fourths of the residual NO_x emissions. In other words, SCR is required for process heaters that comprise nearly three-fourths of the refinery's total heat input capacity. Most refineries are not required to employ SCR systems for NO_x control on any boilers or process heaters.
- The permit limits ammonia emissions from the SCR-equipped process heaters to a maximum concentration of 5 parts per million by volume. The Department is not aware of any other petroleum refinery or similar facility that is required to achieve a limit that is more stringent.
- The permit requires highly efficient recovery of sulfur from refinery waste streams, with a design efficiency level of more than 99.97 percent and an SO_2 emission limit of only 33.6 pounds per hour. The Department is not aware of any other petroleum refinery that is required to achieve a limit that is this stringent.
- The permit requires the refinery to meet several equipment design standards and work practice requirements in order to minimize SO_2 emissions during upsets and malfunctions of the sulfur recovery process. These measures include a requirement to curtail operations and to divert sulfur-containing streams in order to eliminate excess emissions within 15 minutes after the beginning of a process upset, and requirements for excess capacity sufficient to allow the refinery to operate for at least 24 hours during such an upset without further excess emissions. The Department considers this to be an important element of the refinery's design and a focus of the BACT analysis because, in the absence of such measures, the refinery could emit SO_2 at a rate approaching 75 tons per hour during upsets and malfunctions. (This is more than 4,000 times the maximum allowable SO_2 emission rate of 33.6 pounds per hour during normal operations.) The Department is not aware of any other petroleum refinery that is required to meet requirements that are this stringent.
- The permit requires the use of gas compression for recovery and in-process recycling of hydrocarbon vapors from selected hydrocarbon liquid storage tanks. This configuration would result in near-zero emission rates for the affected tanks. The Department is not aware of any other petroleum refinery that is required to employ this equipment configuration.
- The permit requires the use of floating roofs in tandem with a thermal oxidizer for control of VOC emissions from other selected storage tanks. This configuration would result in near-zero emission rates for the affected tanks. The Department is not aware of any other petroleum refinery that is required to employ this equipment configuration.
- The permit requires the use of thermal oxidizers for control of VOC emissions from each vessel within the refinery's Wastewater Treatment Plant. The permit requires that this thermal oxidizer be designed for at least 99.9 percent VOC destruction efficiency, and also requires that a minimum operating temperature and residence time be maintained continuously in order to ensure the maximum feasible degree of VOC destruction at all times. The Department is not aware of any other petroleum refinery or similar facility that is required to achieve such a high level of VOC emission reduction.
- The permit requires the use of carbon adsorption systems for control of VOC emissions from all drains and sumps within the refinery's wastewater collection system. The permit also requires that each system include two carbon canisters in series in order to ensure the

maximum feasible degree of VOC reduction at all times. The Department is not aware of any other petroleum refinery or similar facility that is required to achieve a higher level of VOC emission reduction.

- The permit requires the use of vapor recovery in tandem with thermal oxidizers for control of VOC emissions from gasoline loading into tank trucks and rail cars. This would result in 99.99 percent control of VOC emissions. The Department is not aware of any other petroleum refinery or similar facility that is required to achieve as high a level of VOC emission control.
- The permit requires the use of thermal oxidizers for control of VOC emissions from loading of diesel fuel and aviation jet fuel into tank trucks and rail cars. The permit requires each of these thermal oxidizers be designed for at least 99.9 percent VOC destruction efficiency, and also requires that a minimum operating temperature and residence time be maintained continuously in order to ensure the maximum feasible degree of VOC destruction at all times. The Department is not aware of any other petroleum refinery or similar facility that is required to employ this equipment configuration or to achieve such a high level of VOC emission reduction.
- The permit requires the use of low-NO_x burners to minimize emissions of NO_x from thermal oxidizers used to control VOC emissions, this equipment is state of the art and used in California refineries.
- The permit requires that the refinery implement a thorough and stringent program for preventing VOC emissions by monitoring, detecting, and repairing leaks in equipment such as valves and pumps. More than 60,000 components (individual pieces of equipment) will be subject to these requirements. Although nearly all petroleum refineries are required to implement "Leak Detection and Repair" or "LDAR" programs under federal regulations, the program required by the proposed permit exceeds the requirements of other programs in a variety of ways:
    - More extensive LDAR program applicability: The proposed permit includes LDAR program requirements for flanges and screwed connectors, which represent nearly half of the total number of affected components. The LDAR program requirements at most refineries do not extend to this type of equipment.
    - Lower leak levels: Under the proposed permit, equipment is deemed to be leaking if the measured concentration exceeds 100 parts per million by volume (ppmv) for some types of components and 500 ppmv for all other types. The LDAR program requirements for most refineries do not consider equipment to be leaking until the concentration is 10,000 ppmv, which is 20 to 100 times as high as the limit in the proposed permit.
    - Faster repair requirements: Under the proposed permit, a first attempt at repair is required within 24 hours, and successful repair is generally required within 7 days. The LDAR programs at most refineries only require that a first attempt at repair be made within 5 days and that successful repair be completed within 15 days.
    - Limits on the number of leaking components: Under the proposed permit, repair could be delayed beyond the 7-day period that is generally required, but only to the extent that the number of leaking components is less than a very small percentage of similar components refinery-wide. The LDAR programs at most refineries do not include any such restrictions.
    - More frequent monitoring: The proposed permit requires frequent monitoring of all types of components, regardless of refinery's past achievements with regard to the

percentage of leaking components. For example, the proposed permit requires quarterly monitoring of valves, whereas the LDAR programs at most refineries would require only annual monitoring.

- The permit requires that the refinery implement a thorough and stringent program for preventing VOC emissions by monitoring, detecting, and repairing leaks in the refinery's cooling water system. The permit specifies continuous monitoring of all cooling water streams at the Arizona Clean Fuels refinery. The Department is not aware of any other petroleum refinery or similar facility that is required to implement a program for minimizing VOC emissions from cooling towers that is this stringent. Most petroleum refineries are not required to implement any type of LDAR program for the cooling water system, and the few that are generally are require to perform sampling only four times per year. This potentially allows for tremendous quantities of VOC to be emitted from the cooling towers without detection.
- The permit restricts the emergency generator and the emergency fire water pumps to burning only ultra-low-sulfur Diesel fuel in order to minimize SO_2 emissions. The Department is not aware of any other petroleum refinery that is required to comply with a restriction that is this stringent.
- The permit requires that the emergency generator and the emergency fire water pumps be designed and equipped with combustion modifications to minimize emissions of NO_x, CO, and PM_{10}. The emission limits in the proposed permit are much more stringent than those imposed on any similar facility.

EMISSION IMPACT ANALYSES

The site of the proposed refinery is located in a "clean air area" – one that has been designated as attainment or unclassifiable for all criteria pollutants under the Clean Air Act.

As part of the permit application review process, the Department performed a detailed review of the Ambient Air Quality Impact Analysis performed by the applicant, including confirmatory dispersion modeling. Based on the result of this review, the Department has concluded that the proposed refinery will not cause or contribute to an exceedance of any National Ambient Air Quality Standard (NAAQS), PSD Increment, or Arizona Ambient Air Quality Guideline (AAAQG) level. Specifically, the analysis shows the following:

- The maximum predicted ambient concentration of PM_{10} is less than 64 percent of the annual NAAQS and less than 54 percent of the 24-hour NAAQS. Each of these values includes all existing sources and background concentration; the refinery's modeled impact represents less than 4 percent of the predicted annual average concentration and less than 15 percent of the predicted 24-hour average concentration.
- The maximum predicted ambient concentration of SO_2, including all existing sources and background concentration, is less than 15 percent of the NAAQS for each of the three averaging periods (3-hr, 24-hr, and annual). The refinery's modeled impact represents less than 10 percent of the NAAQS for each of the three averaging periods. The modeled impact of the refinery on ambient NO_X concentration is less than 1 percent of the NAAQS.

- The modeled impact of the refinery on ambient CO concentration is less than 2 percent of the NAAQS.
- The modeled impact of the refinery is less than all applicable PSD increments.
- The modeled impact of the refinery on ambient concentration of state air toxics is less than ten percent of the AAAQG for 34 of the 46 hazardous air pollutants expected to be emitted by the plant. For the remaining 12 pollutants, ambient impacts were mitigated to the maximum possible extent and were deemed to meet requirements. These pollutants, and the ambient impact as a percentage of the AAAQG, are as follows:

Benzene (93%)	Mercury (20%)
Chlorine (74%)	Cadmium (18%)
H_2S (47%)	Aluminum (16%)
Silver (44%)	Lead (15%)
Formaldehyde (28%)	Phenol (13%)
Selenium (28%)	Ammonia (11%)

PUBLIC PARTICIPATION PROCESS

A public notice for the draft permit, including the dates and times for three public meetings and three public hearings, was published in the Arizona Republic on September 14, 2004, and on September 21, 2004. Additional notices were also published in the Yuma Daily Sun and the Bajo El Sol (Yuma) newspapers on September 17, 2004, and September 24, 2004. Public meetings were held in Wellton, Phoenix, and Yuma on October 5, 6, and 7, 2004, respectively. Public hearings were held in Wellton on November 9, 2004, in Phoenix on November 10, 2004, and in Yuma on November 16, 2004. During the public comment period, a request was made for an extension of the comment period. In response to this request, ADEQ published a notice in the Arizona Republic on December 10, 2004 and December 17, 2004, and in the Yuma Daily Sun and Bajo El Sol on December 10, 2004 and December 17, 2004, stating that the written comment period would be extended, and that all comments were to be post-marked or received no later than January 10, 2005.

Comments, questions, and objections were received during the public comment period in both verbal and written formats. This summary presents the Department's responses to the issues raised during the public comment period.

Project Need

Inquiries were made regarding the need for a refinery in order to satisfy the demand for gasoline in Arizona.

If the Department concludes that a proposed major stationary source will comply with all applicable air quality laws and regulations, as is the case with the proposed refinery, the Department is legally obligated to issue the air permit for the site proposed by the applicant. The need for the project in order to satisfy societal needs is not a consideration in the air permit application review and approval process.

Project Viability
Concerns were expressed regarding the viability of the refinery project.

If the Department concludes that a proposed major stationary source will comply with all applicable air quality laws and regulations, as is the case with the proposed refinery, the Department is legally obligated to issue the air permit for the project proposed by the applicant. The viability of the project is not a consideration in the permit application review and approval process.

Site Selection
One commenter expressed concern regarding the environmental justice implications of siting the refinery in Yuma County.

Because the Department receives federal financial assistance, the Department's decision regarding the air permit is subject to Title VI of the Civil Rights Act, 42 U.S.C. § 2000d et seq. The Department has committed to seek out and be responsive to community concerns regarding public health and the environment, including all claims of inequity due to environmental impacts.

Consistent with guidance from the U.S. EPA and the federal Council on Environmental Quality, the Department has evaluated the impacts that issuance of the refinery's air permit will have on minority communities and sensitive populations. Based on this evaluation, the Department has determined that the issuance of the refinery's air permit will not result in any disparate, adverse impacts on any minority community or sensitive population. A copy of ADEQ's analysis is available upon request.

One commenter expressed concerns that one of the poorest counties in Arizona would bear a disproportionate share of negative environmental consequences from this refinery.

ADEQ has reviewed the Census information for Arizona, Yuma County, Tacna, and Wellton and found the following:

Location	Poverty Status
Arizona	9.9%
Yuma County	15.5%
Tacna	22.4%
Wellton	16.1%

According to these demographics, ADEQ has determined that theses levels are consistent with a community that is historically an agricultural and retirement community. Because there is no evidence of a disproportionate number of sources of pollution moving into or relocating to Yuma County, ADEQ has proceeded with this licensing decision.

Concerns were expressed regarding the site selection process.

The Department played no role in the site selection process for the refinery; for a proposed stationary source in a clean air area, such as the site of the proposed refinery, the Department has no authority to require an analysis of alternative sites. Where the Department concludes that a proposed major stationary source will comply with all applicable air quality laws and regulations, as is the case here, the Department is legally obligated to issue the air permit for the site proposed by the applicant.

Public Involvement

An inquiry was made regarding the need for a public vote on the construction of the refinery.

This permitting decision implements the Department's authority and obligations under the federal Clean Air Act and title 49, chapter 3 of the Arizona Revised Statutes. These laws do not provide the Department with the authority to require a vote before acting on the permit application. The Department does not have any information indicating whether the construction of the refinery will require any other governmental approvals that might require a public vote.

One commenter suggested that the public comment period should be reopened if the conditions of the draft permit are revised by the Department.

The comment is acknowledged. As the permit has only been made more stringent by the addition of benzene and particulate matter ambient monitoring requirements, the Department has determined that additional public notice and participation are unnecessary.

An inquiry was made concerning the mechanism by which the public will be involved in addressing issues of worker safety, safety of the general public, and terrorism associated with the refinery.

Provisions for public involvement in risk management planning, which pertains to the safety of the general public, are provided by § 112(r) of the federal Clean Air Act and by 40 CFR § 68.210. The Department is not aware of any provisions for public involvement in matters pertaining to worker safety or terrorism at the refinery. These issues are not considerations in the air permit application review and approval process.

One commenter expressed a desire for greater detail regarding the petroleum refining process and noted that the process flow schematic included in the Technical Support Document and the Executive Summary document was described by the Department as "simplified."

The Department considers the "Simplified Process Flow Diagram" to be adequate for its purpose, which is to provide a general overview of the interrelationship of the various process units at the refinery. The Department notes that the permit (at Attachment "C") includes a detailed equipment listing and the Technical Support Document (at Sections II.A through II.CC) provides significantly more detail regarding the processing steps and technologies to be used at the refinery. Those wanting additional information can review the permit application, which (at Appendix A) includes twenty unit-specific process flow diagrams. Copies of these materials are available at the Department's Records Center at 1110 West Washington Street, Phoenix, Arizona. Copies can be requested by contacting the Records Center at (602) 771-4380, or toll-

free in Arizona at (800) 234-5677, extension 771-4380. For the duration of the 118-day comment period, the materials also were made available for public review at the following locations:

- Burton Barr Central Library - 1221 N. Central Ave., Phoenix, Arizona 85004
- Yuma County Library - 350 Third Ave., Yuma, Arizona 85364
- Wellton Public Library - 10425 William St. / POB 577, Wellton, Arizona 85356

Emission Estimates

An inquiry was made regarding the refinery's sulfur recovery capacity and the air pollutant emissions from the sulfur recovery process.

The nominal sulfur recovery capacity of the proposed refinery is 608 long tons per day, or approximately 57,000 pounds per hour. The maximum allowable SO_2 emission rate from the sulfur recovery process is 33.6 pounds per hour. This represents a sulfur recovery efficiency of 99.97 percent.

A concern was expressed regarding the fact that only five pollutants were listed in Table 1 of the Executive Summary document distributed by the Department as part of the public notice package.

The Executive Summary document was intended only to provide a brief overview of the proposed permitting action. Table 1 lists only the emissions of criteria pollutants that will be emitted by the proposed refinery in amounts greater than the PSD significant levels. A more detailed accounting of the emissions from the proposed refinery is provided in Section III of the Technical Support Document, as acknowledged elsewhere by this commenter.

A concern was expressed regarding the fact that nickel, a hazardous air pollutant, is not discussed in the Executive Summary document.

The Executive Summary document was intended only to provide a brief overview of the proposed permitting action. Table 1 of the Executive Summary lists only the emissions of criteria pollutants that will be emitted by the proposed refinery in amounts greater than the PSD significant levels; emissions of nickel are a subset of the listed PM_{10}. Also, the maximum predicted ambient nickel concentrations are not discussed separately in the Executive Summary because they are less than 10 percent of the corresponding Arizona Ambient Air Quality Guidelines, as shown in Table VII-7 of the Technical Support Document.

A concern was expressed regarding the fact that the emission rates listed in the June 8, 2004, permit application are higher than the allowable emission rates listed in documents distributed by the Department as part of the public notice package.

In making its determinations of Best Available Control Technology (BACT), the Department considers the technologies and emission limits proposed by the applicant, but is not bound by those proposals. In the case of the proposed refinery, the Department ultimately made BACT determinations for several emission units that were more stringent than what the applicant proposed. The maximum allowable emission rates tabulated by the Department reflect the final BACT determinations, whereas the applicant's emission estimates did not. The following table shows a comparison of the refinery-wide emissions listed in the initial permit application (before

the Department's BACT determinations) and the refinery-wide allowable emissions in the air permit presently being issued (after the Department's BACT determinations). Note that CO emissions allowed by the final permit are higher than those initially proposed by the Permittee. This increase occurred as a direct result of the requirement to reduce NO_X emissions – the CO emission levels that were initially proposed by ACF aren't consistently achievable with the ULNB that are required by the permit.

	Emissions (tons/yr)				
	NO_x	SO_2	CO	VOC	PM_{10}
Initial Permit Application	1,507	1,327	499	2,378	261
Proposed Permit	396	251	819	251	176

One commenter expressed concern that Table 3.3 of the PSD permit application lists emission rates of 1,506.89 tons NO_x per year; 1,326.89 tons SO_2 per year; 2,372.17 tons VOC per year; and 261.25 tons PM_{10} per year; and 261.25 tons CO per year. This commenter also expressed concern that Table B.12 of the PSD permit application lists uncontrolled VOC emissions of 3,178.00 tons per year and controlled VOC emissions of 413.00 tons per year.

With the exception of the CO emission rate, which the Department presumes is a typographical error, each of the emission rates listed in this comment is consistent with the data provided the permit application submitted December 22, 1999, for a refinery in Maricopa County. Numerous revisions to the permit application were made between December 1999 and June 2004; the later versions of Table 3.3 and Table B.12 correspond much more closely with the allowable emission rates listed in documents distributed by the Department as part of the public notice package.

Concerns were expressed regarding the basis for the Department's emission estimates and the certainty of these estimates.

The allowable emission rates listed in documents distributed by the Department as part of the public notice package reflect the total maximum allowable emissions, or "potential to emit," of all equipment covered by the air permit. The basis for these estimates is discussed in detail, on a unit-by-unit basis, in Section III of the Technical Support Document. The air permit includes numerous requirements for monitoring, recordkeeping, and reporting to ensure the enforceability of the permitted emission limits. Accordingly, the Department can state with a high degree of certainty that the actual emissions from the refinery will be no higher than the Department's estimates of potential to emit.

One commenter expressed concern that Table B.29 of the PSD permit application, pertaining to truck traffic, lists uncontrolled emission rates of 44.46 tons PM per year and 8.76 tons PM_{10} per year and controlled emission rates of 22.46 tons PM per year and 4.83 tons PM_{10} per year. This commenter also expressed concern that total emissions from truck traffic are 80.97 tons per year.

The commenter has misinterpreted the meaning of the values in Table B.29: The listed "uncontrolled" values are the emission rates that would occur if no control measures were implemented; the listed "controlled" values are the projected maximum emissions, considering

the effect of required control measures. Also, the values are not additive: The listed PM_{10} emission rates are a subset of the listed PM emission rates. The total particulate matter emissions from truck traffic are projected to be 22.46 tons per year, of which 4.83 tons per year is PM_{10} (particulate matter with an aerodynamic diameter smaller than 10 micrometers).

An inquiry was made regarding the actual and allowable emissions of mercury from the refinery.

The refinery's maximum potential emissions of mercury are approximately 18 pounds per year, based on assumed continuous operation of all equipment at maximum permitted capacity. Even with this conservative assumption, these emissions would not cause an exceedance of any ambient air quality standard or guideline. The permit does not contain any explicit limitations on mercury emissions because no such limitations are necessary in order to ensure compliance with all applicable requirements.

An inquiry was made concerning the composition of the "combustion products" that will be discharged to the atmosphere from the emergency flares in the event of an emergency release.

In the event that hydrocarbon material is routed to the emergency flares, it is estimated that at least 98 percent of the material will be combusted. The products of this combustion reaction are primarily water (H_2O) and carbon dioxide (CO_2).

Control Technology Analysis

One commenter expressed general concern with the appropriateness of the Department's determinations of Best Available Control Technology (BACT).

As required by the federal Clean Air Act and by Article 4 of A.A.C. Title 18, Chapter 2, the Department made determinations of BACT for each emission unit at the refinery and for each pollutant emitted based on the maximum achievable degree of emission reduction, taking into account technical feasibility, environmental impacts, economic impacts, energy impacts, and other costs.

One commenter suggested that the air permit should require the most stringent level of air pollution control "without excessive reliance on economics or engineering feasibility."

In making its BACT determinations, the Department did not rely excessively on economic considerations. Instead, as explained in detail in Section V of the Technical Support Document, the Department gave appropriate consideration to environmental, economic, and energy impacts and other costs as required by § 169(3) of the federal Clean Air Act.

One commenter suggested that the air permit should impose air pollution control requirements "to the extent that technology allows without regard to economics."

Pursuant to § 169(3) of the federal Clean Air Act, the Department is required to consider economic impacts in the control technology analysis.

A concern was expressed regarding the way in which the Department explained economic "cost benefit decisions" in the context of discussing the control technology analysis in the Technical Support Document.

The Department presumes that the "cost benefit decisions" cited in this comment are the instances where the Department, in conducting the control technology analysis for the proposed refinery, identified a control technology that is more stringent than what the applicant proposed and rejected that technology, in whole or in part, due to economic considerations. There are several such instances, all of which are identified and discussed in detail in the Technical Support Document (TSD page numbers provided in parentheses):

- Selective catalytic reduction (SCR) for some process heaters (p. 166);
- Substitution of fixed-roof configuration with internal floating roof and thermal oxidizer for external floating roof storage tanks (p. 186);
- Addition of vapor recovery system upstream of the thermal oxidizer serving the distillate product loading racks (p. 192);
- Specification of magnetic-drive pumps (pp. 200-201);
- Specification of bellows-seal valves (p. 201);
- SCR and oxidation catalyst for catalyst regenerator vents (p. 205);
- Higher-efficiency baghouse for coke silo (pp. 206-207);
- Substitution of indirect-contact cooling tower for wet cooling tower (p. 210);
- SCR for internal combustion engines (p. 214); and
- Oxidation catalyst for internal combustion engines (pp. 217-218).

A concern was expressed regarding the extent to which the Department based its determinations of Best Available Control Technology (BACT) on comparisons between what is proposed for this refinery and what is achieved at other petroleum refineries.

The allowable emissions from the proposed refinery are, in fact, much less than the actual emissions from any currently existing refinery in the United States. The Department considered this to be an important fact for the public to consider when reviewing the proposed permitting action and participating in the permitting process. However, this fact was not a significant consideration in the Department's analysis of control technologies. The comparisons of site-wide allowable emissions from this refinery and site-wide actual emissions from existing refineries were performed during the preparation of the public notice package, and after the preliminary BACT determinations were made. The Department's rationale for each of its BACT determinations is set forth in detail in Section V of the Technical Support Document, and none of the determinations is based on the fact that this refinery will be the best-controlled refinery in the United States. In performing the control technology analysis, the Department did consider the controls installed at other refineries and the emission limits achieved at other refineries, but only to the extent that this information is useful in ascertaining the technical feasibility of certain control technologies and in identifying the degree of emissions reduction achievable with certain control technologies.

Two commenters expressed concern regarding the adequacy of the permit with respect to control requirements for emissions of hazardous air pollutants.

The permit includes all applicable air pollution control requirements for hazardous air pollutants. In addition, the Department performed an air quality impacts analysis using the refinery's

maximum potential hazardous air pollutant emission rates, the results of which demonstrated that the refinery's emissions will not cause an exceedance of any Arizona Ambient Air Quality Guideline. Based on this analysis, the Department has concluded that the permit includes adequate control requirements for hazardous air pollutant emissions.

One commenter expressed concern regarding the Department's decision to establish an operational standard as the emission limitation representing Best Available Control Technology (BACT) for SO_2 emissions from natural gas-fired combustion sources.

For the two natural gas-fired steam boilers at the refinery, the Department determined that the use of commercially available, pipeline-quality natural gas is the control technique that will result in the maximum achievable degree of reduction in SO_2 emissions. This control technique is the basis for the Department's BACT determination. The Department identified two possible forms of expression for the BACT emission limitation: an operational standard, prohibiting the use of any fuel other than natural gas, and a numerical limit on emission rate. The Department determined that both forms of expression would provide the same level of emission reduction. The Department also determined that the numerical limit on emission rate could provide either less enforceability at equivalent cost, if coupled with any compliance demonstration requirement other than continuous emissions monitoring, or equivalent enforceability at significantly higher cost, if coupled with a requirement for continuous emissions monitoring. For these reasons, the Department elected to express the BACT emission limitation as an operational standard.

One commenter expressed concern regarding the Department's decision to establish operational standards as the emission limitations representing Best Available Control Technology (BACT) for VOC emissions from gas-fired combustion sources.

For each of the gas-fired boilers and process heaters at the refinery, the Department determined that the adherence to good combustion practices is the control technique that will result in the maximum achievable degree of reduction in VOC emissions. This control technique is the basis for the Department's BACT determination. The Department identified two possible forms of expression for the BACT emission limitation: an operational standard, requiring that the applicant meet the numerical limit on carbon monoxide emission rate established as BACT for that pollutant, and a numerical limit on VOC emission rate. The Department determined that both forms of expression would provide the same level of emission reduction. Compliance with the operational standard would be demonstrated using a continuous carbon monoxide emissions monitoring system. The Department determined that the numerical limit on VOC emission rate could provide either less enforceability at equivalent cost, if coupled with any compliance demonstration requirement other than continuous VOC emissions monitoring, or equivalent enforceability at significantly higher cost, if coupled with a requirement for continuous VOC emissions monitoring. For these reasons, the Department elected to express the BACT emission limitation as an operational standard.

One commenter expressed concern with the fact that the refinery will emit volatile organic compounds and hydrogen sulfide as a result of leaking piping components, pump seals, compressor seals, and other equipment.

Emissions due to leaking equipment cannot be entirely avoided in this refinery or in any facility handling liquid and gaseous materials. The Department's BACT determination is that the leak

detection and repair program included in the refinery's air permit represents the maximum achievable degree of emission reduction, as described in detail in Sections V.I.1 and V.I.2 of the Technical Support Document.

Three commenters indicated that the use of refinery fuel gas does not represent BACT; that the air permits for the proposed refinery site in Maricopa County prohibited the use of refinery fuel gas; and that fuels containing lower levels of sulfur must be used.

The comments are incorrect with regard to air permits issued and proposed for the Maricopa County refinery site; each of these permits authorized the use of refinery fuel gas and/or natural gas as fuel. In the present permitting action, the Department determined that BACT for SO_2 emissions from each of the process heaters is the use of low-sulfur refinery fuel gas, as described in detail in Section V.B.2 of the Technical Support Document. This represents the Department's determination of the maximum achievable degree of emission reduction, taking into account technical feasibility, environmental impacts, economic impacts, energy impacts, and other costs. No more effective control options were identified by the Department during its BACT analysis, and no information characterizing a more effective and technically feasible control option was provided by the commenters.

One commenter expressed concern regarding the pollution that will result from the burning of "highly contaminated residual oil."

The concern is unfounded. The refinery's air permit does not allow for the combustion of residual oil at any emissions unit. The steam boilers are permitted to burn only natural gas; the process heaters, only natural gas or low-sulfur refinery fuel gas; and the emergency Diesel engines, only low-sulfur Diesel fuel.

Air Quality Impact Analysis

An inquiry was made regarding the Department's use of the phrase "clean air area" in the Executive Summary document to describe the site of the proposed refinery, in light of the fact that the area is not classifiable for some criteria pollutants.

As required by § 107(d)(1)(B) of the federal Clean Air Act, the U.S. EPA designates each area of the United States as to its attainment status with respect to each of the six criteria air pollutants. These designations are codified at 40 CFR 81 subpart C; for Arizona, the designations are at 40 CFR § 81.303. The three possible designations under the Act are "nonattainment," "attainment," and "unclassifiable." The Nonattainment New Source Review permitting program applies to nonattainment areas, whereas the Prevention of Significant Deterioration (PSD) permitting program applies in attainment and unclassifiable areas. The phrase "clean air area" was used by the U.S. Congress in establishing the PSD program in 1977 and continues to be customarily used to describe areas that are subject to the PSD program. The site of the proposed refinery in Yuma County is designated as attainment or unclassifiable with respect to all criteria pollutants.

Concerns were expressed regarding the effects on ozone levels due to air pollutant emissions from the refinery.

Unlike other pollutants of concern, ozone will not be directly emitted by the refinery. Rather, tropospheric ozone formation occurs by a series of complex photochemical reactions involving

NO_x and VOC, both of which will be emitted by the refinery. Due to this formation mechanism, ozone modeling is performed on a regional scale using three-dimensional photochemical grid models, whereas modeling for other pollutants emitted from individual sources is generally performed using Gaussian plume models. Arizona and federal permitting regulations do not require ozone impact analyses for stationary source permitting.

The Permittee performed and submitted an ozone impact analysis in August 2002, as part of the permit application for a proposed refinery in Maricopa County. That analysis showed that the refinery would not have any adverse impact on the Phoenix ozone nonattainment area, even when sited less than 10 miles outside the nonattainment area and with significantly higher modeled VOC emission rates than are allowed by the proposed permit. In light of the much greater distance to the Phoenix ozone nonattainment area and the reductions in allowable VOC emissions relative to the previous modeling analysis, the Department concluded that no further analysis is necessary for the present refinery location.

Concerns were expressed regarding the meteorological conditions in the area around the refinery.

As described in detail in Section VII of the Technical Support Document, the Department has performed an air quality impacts analysis using the most representative available meteorological data from the National Weather Service in conjunction with the maximum potential emissions from the refinery. The results of this analysis show that the emissions from the refinery will not cause or contribute to an exceedance of any National Ambient Air Quality Standard (NAAQS) or Arizona Ambient Air Quality Guideline (AAAQG). Based on the results of that analysis, the Department has concluded that the emissions from the refinery and the environmental effects of those emissions are acceptable.

One commenter expressed concern that the permit would allow perchloroethylene emissions of more than 25 tons per year but no "refined modeling" was performed.

The comment is incorrect on both counts. As shown in Table III-A of the Technical Support Document, the refinery-wide maximum potential emissions of perchloroethylene are 2.6 tons per year. These emissions will occur due to the use of perchloroethylene in the Catalytic Reforming Unit Catalyst Regenerator (Equipment ID V-05800) and the Butane Conversion Unit Catalyst Regenerator (Equipment ID V-15340), as discussed in detail in Section III.M of the Technical Support Document. As shown in Table VII-7 of the Technical Support Document, the maximum modeled concentrations of tetrachloroethene, for all three averaging periods, are less than two percent of the corresponding Arizona Ambient Air Quality Guideline (AAAQG) levels. (Tetrachloroethene and perchloroethylene are both the same chemical, CCl4, Chemical Abstract Service No. 127-18-4.)

Two commenters expressed concern that the Arizona Ambient Air Quality Guidelines (AAAQG) will be exceeded for twelve pollutants.

The concern is unfounded. ADEQ's documentation correctly indicates that maximum predicted concentrations for 12 hazardous air pollutants will be greater than 10% of the corresponding AAAQG, but still less than the guideline concentration itself. A list of those 12 pollutants and the corresponding percentages of the guideline concentrations follows:

Benzene (93%)	Mercury (20%)
Chlorine (74%)	Cadmium (18%)
H_2S (47%)	Aluminum (16%)
Silver (44%)	Lead (15%)
Formaldehyde (28%)	Phenol (13%)
Selenium (28%)	Ammonia (11%)

For all other hazardous air pollutants, concentrations are predicted to be less than 10% of the corresponding AAAQG levels.

One commenter expressed concern that the discussion of dispersion modeling results for hazardous air pollutants in the Technical Support Document is not sufficient to inform the public of potential impacts.

The Technical Support Document, in Section VII.A.3.d, does include a detailed discussion of the results of dispersion modeling analyses performed for hazardous air pollutant emissions from the refinery. This discussion shows that the maximum predicted concentration of each hazardous air pollutant is less than the corresponding Arizona Ambient Air Quality Guideline value. On the basis of these results, the Department has concluded that the impacts of hazardous air pollutant emissions from the refinery are acceptable.

An inquiry was made regarding the environmental effects of the refinery between the years 2009 and 2034.

As described in detail in Section VII of the Technical Support Document, the Department has performed an air quality impacts analysis using worst-case meteorological data and the maximum potential emissions from the refinery. The results of this analysis show that the emissions from the refinery will not cause or contribute to an exceedance of any National Ambient Air Quality Standard (NAAQS) or Arizona Ambient Air Quality Guideline (AAAQG). The NAAQS and AAAQG have been established at levels that limit excess lifetime cancer risk and that are protective of public health, including the most sensitive members of the population. Based on the results of that analysis, the Department has concluded that the emissions from the refinery and the environmental effects of those emissions are acceptable.

Concerns were expressed regarding the combined effect on air quality of the proposed refinery and other existing air pollution sources in the area, in particular a proposed electric power plant elsewhere in Yuma County.

The Department's air quality impacts analysis for the proposed refinery included cumulative dispersion modeling analyses that took into consideration the emissions from the refinery, the Wellton Mohawk Generating Facility, and other nearby emission sources. As discussed in detail in Section VII of the Technical Support Document, the results of this analysis showed that the emissions from the refinery will not cause or contribute to exceedance of any National Ambient Air Quality Standard or PSD increment.

A concern was expressed regarding the fact that air pollutant emissions during the construction of the refinery were not considered in the growth analysis.

The growth analyses required by A.A.C. R18-2-407(I)(1) and (I)(2) are performed for the purpose of determining the air pollutant emissions from permanent residential, commercial, and industrial growth that will occur in order to support the proposed new major stationary source. Emissions from temporary sources and mobile sources, as would be associated with the construction of the refinery, are excluded from this analysis. (See, for example, Page I-D-5 of U.S. EPA's PSD Workshop Manual.)

Concerns were expressed regarding the use of upper air data from Tucson in dispersion modeling performed as part of the air quality impacts analysis.

Representativeness of meteorological data is a function of the height of the measurement; there is much less site-to-site variability for upper air measurements than for measurements taken close to the surface. As a result, upper air measurements are gathered at a relatively small number of locations and are considered representative of large spatial domains. The Department has concluded that upper air data gathered in Tucson are sufficiently representative of the proposed refinery site to be acceptable for use in the air quality impact analysis.

A concern was expressed regarding the fact that the air quality impact analysis did not take into account the excess emissions that "almost certainly will be released" during "upsets, malfunctions, excess emissions episodes, breakdowns, power dips, power surges, power failures, lightning strikes, human errors, mechanical failures, etc."

The purpose of the air quality impact analysis is to ensure that the allowable emissions from the refinery will not cause or contribute to any violation or exceedance of any ambient air quality standard or guideline level. A separate but equally important element of the air permit application review and approval process is a determination by the Department that the refinery, when constructed and operated in accordance with good air pollution control practices, can achieve continuous compliance with the permitted emission limitations and standards. In light of these two determinations made by the Department, the air quality impacts analysis is properly based on the maximum allowable emission rates, as was done in the case of the refinery. The Department does not engage in speculation as to the air quality impacts of unanticipated non-compliance.

Secondary Emissions

Concerns were expressed regarding emissions increases that may occur at other stationary sources that are built as a direct or indirect result of the construction or operation of the refinery.

The air quality impact analysis required by the Prevention of Significant Deterioration (PSD) permitting program is required to include the emissions from the new major stationary source (i.e., the refinery) as well as any "secondary emissions." The term "secondary emissions," as defined at A.A.C. R18-2-101(103), includes only the emissions increases that are specific, well-defined, and quantifiable. While it is possible that the construction and operation of the refinery would lead to the building of other manufacturing plants in Yuma County, this is entirely

uncertain, and the Department has not identified any emissions increases meeting the criteria established in the regulatory definition of "secondary emissions."

Concerns were expressed regarding emissions increases from mobile sources that may occur as a direct or indirect result of the construction or operation of the refinery.

The air quality impact analysis required by the Prevention of Significant Deterioration (PSD) permitting program is required to include the emissions from the new major stationary source (i.e., the refinery) as well as any "secondary emissions." The term "secondary emissions," as defined at A.A.C. R18-2-101(103), specifically excludes any emissions that would come from a mobile source, such as the emissions from the tailpipe of a truck or from a locomotive.

Ambient Monitoring and Emission Monitoring

Concerns were expressed regarding the adequacy of the permit with regard to ambient monitoring requirements.

The draft permit (at Section XXIV.B.14 of Attachment "B") required a network of ambient hydrogen sulfide monitors to ensure that off-site concentrations of this hazardous air pollutant do not exceed allowable levels. This monitoring requirement has been retained in the final permit. The draft permit did not require any other ambient air quality monitoring because the Department had concluded that no ambient air quality standards will be threatened by the proposed refinery. In light of the significant level of concern voiced by the public with regard to this issue, the Department has added to the permit (at Section XXX of Attachment "B") state-only-enforceable requirements for ambient monitoring networks for benzene and particulate matter.

Concerns were expressed regarding the adequacy of the permit with regard to emission monitoring.

The permit includes all applicable requirements pertaining to monitoring, recordkeeping, and reporting, including requirements for 50 continuous emission monitoring systems.

One commenter expressed concern that the permit would allow perchloroethylene emissions of more than 25 tons per year but does not require any monitoring for these emissions.

The comment is incorrect on both counts. As shown in Table III-A of the Technical Support Document, the refinery-wide maximum potential emissions of perchloroethylene are 2.6 tons per year. These emissions will occur due to the use of perchloroethylene in the Catalytic Reforming Unit Catalyst Regenerator (Equipment ID V-05800) and the Butane Conversion Unit Catalyst Regenerator (Equipment ID V-15340), as discussed in detail in Section III.M of the Technical Support Document. Section V.D.8 in Attachment "B" to the permit includes extensive monitoring requirements for emissions of organic Hazardous Air Pollutants (HAP), including perchloroethylene, pursuant to 40 CFR 63 subpart UUU.

A concern was expressed regarding the adequacy of the permit requirements for monitoring of emissions from the emergency flares.

Section XXV.C of Attachment "B" of the permit includes exhaustive and prescriptive monitoring, recordkeeping, and reporting requirements that apply during any period when the flares are used to combust any material other than the natural gas used as pilot fuel. These requirements will allow the Department to quantify emissions during flaring events with a very high degree of accuracy and confidence.

A concern was expressed regarding the use of monitoring data generated by refineries in determining compliance with those refineries' emission limits.

The compliance determination approach described by the commenter is required by various regulations required under the federal Clean Air Act and cannot be eliminated through the air permit application review and approval process.

Concerns were expressed regarding the assignment of responsibility for performing emissions monitoring, emissions testing and reporting.

The permit places the responsibility for compliance with all applicable requirements, including requirements for emissions monitoring, testing, and reporting, with the facility's responsible official. This official is required to certify the truth, accuracy, and completeness of all reports and other documents that are required to be submitted to the Department. In addition, upon startup of the refinery, the Department will have at least three employees dedicated to enforcement of the refinery's air permit, and these employees will observe all compliance tests.

Concerns were expressed regarding the Department's practice with respect to making monitoring and testing reports available to the public.

Pursuant to A.R.S. § 49-432, the Department generally makes all records and reports available to the public, except as described below. These records and reports are available at the Department's offices at 1110 West Washington Street in Phoenix, and can also be requested by contacting the Department's Records Center at (602) 771-4380, or toll-free in Arizona at (800) 234-5677, extension 771-4380.

As provided by A.R.S. §§ 49-432(C) and (D), the information made available to the public does not include confidential information, such as information that has been demonstrated to constitute a trade secret or is likely to cause substantial harm to the company's competitive position. However, pursuant to § 49-432(E), certain information must always be made available to the public (i.e., it may not be withheld on the basis of confidentiality). This information include the name and address of any permit applicant or permittee; the chemical constituents, concentrations and amounts of any emission of any air contaminant; and the existence or level of a concentration of an air pollutant in the environment.

One commenter indicated that "the permit limits the recordkeeping to three years" and further stated that the Clean Air Act requires that the records be "kept indefinitely and available to the public indefinitely."

The comment is incorrect on both counts. Condition XIII.B in Attachment "A" to the permit requires that all records and supporting information be maintained for a period of at least five years from the date of the monitoring sample, measurement, report, or application, pursuant to A.A.C. R18-2-306(A)(4)(b). The Clean Air Act is silent as to the duration of recordkeeping requirements.

One commenter expressed concern regarding the permit requirements for monitoring and recording of fuel usage and heat input and indicated that these methods are not sufficient to determine compliance.

For each of the eighteen process heaters and two steam boilers, the permit includes explicit limitations on the fuels that may be combusted and on the daily heat input rate. The permit also includes requirements for monitoring and recording the fuel usage and the heat input, on an hourly basis, for each heater and boiler. The Department has concluded that these monitoring and recordkeeping requirements are sufficient to provide adequate assurance of continuous compliance with the applicable heat input and fuel usage limitations.

Health Effects

Concerns were expressed regarding the effect of air pollutant emissions from the refinery on incidences of asthma and other respiratory problems in the local population, particularly in children and the elderly.

As described in detail in Section VII of the Technical Support Document, the Department has performed an air quality impacts analysis for the refinery. The results of this analysis show that the emissions from the refinery will not cause or contribute to an exceedance of any National Ambient Air Quality Standard (NAAQS) or Arizona Ambient Air Quality Guideline (AAAQG). The NAAQS and AAAQG have been established at levels that are protective of public health, including the most sensitive members of the population. Based on this analysis, the Department has concluded that the air pollutant emissions and the ambient air quality impacts from the refinery are acceptable.

Concerns were expressed regarding the effect of air pollutant emissions from the refinery on incidences of cancer in the local population.

As described in detail in Section VII of the Technical Support Document, the Department has performed an air quality impacts analysis for the refinery. The results of this analysis show that the emissions from the refinery will not cause or contribute to an exceedance of any Arizona Ambient Air Quality Guideline (AAAQG). The AAAQG have been established at levels that limit excess lifetime cancer risk and are protective of public health. Based on this analysis, the Department has concluded that the air pollutant emissions and the ambient air quality impacts from the refinery are acceptable.

An inquiry was made regarding the effect of air pollutant emissions from the refinery on mortality in the local population.

As described in detail in Section VII of the Technical Support Document, the Department has performed an air quality impacts analysis for the refinery. The results of this analysis show that the emissions from the refinery will not cause or contribute to an exceedance of any National

Ambient Air Quality Standard (NAAQS) or Arizona Ambient Air Quality Guideline (AAAQG). The NAAQS and AAAQG have been established at levels that are protective of public health, including the most sensitive members of the population. Based on this analysis, the Department has concluded that the air pollutant emissions and the ambient air quality impacts from the refinery are acceptable.

Concerns were expressed regarding the effect of air pollutant emissions from the refinery on the general health of the local population.

As described in detail in Section VII of the Technical Support Document, the Department has performed an air quality impacts analysis for the refinery. The results of this analysis show that the emissions from the refinery will not cause or contribute to an exceedance of any National Ambient Air Quality Standard (NAAQS) or Arizona Ambient Air Quality Guideline (AAAQG). The NAAQS and AAAQG have been established at levels that are protective of public health, including the most sensitive members of the population. Based on this analysis, the Department has concluded that the air pollutant emissions and the ambient air quality impacts from the refinery are acceptable.

Three commenters suggested that a public health monitoring plan should be implemented in the area near the refinery.

Implementation of a public health monitoring plan is outside the purview of the Arizona Department of Environmental Quality.

Odors

Concerns were expressed regarding the odors emanating from the proposed refinery and the effects of those odors on the local residents.

The Department recognizes that the proposed refinery will emit odorous compounds, of which hydrogen sulfide is the primary pollutant of concern. The Department's BACT analysis indicates that the emissions of hydrogen sulfide and other reduced sulfur compounds will be minimized to the greatest extent possible. In addition, the dispersion modeling analyses performed by the Department indicate that ambient impacts of hydrogen sulfide emissions will be acceptable, and the permit (at Section XXIV.B.14 of Attachment "B") requires a network of ambient hydrogen sulfide monitors to ensure that off-site concentrations do not exceed allowable levels. Based on these facts, the Department has concluded that no additional permit terms and no additional research are necessary.

One commenter indicated that the permit does not comply with Arizona's State Implementation Plan because it does not include enforceable conditions that would prohibit odors from "moving off the site."

The comment is incorrect. The State Implementation Plan and applicable Arizona regulations include a prohibition on emissions in such quantities or concentration that would "unreasonably interfere with the comfortable enjoyment of life or property of a substantial part of a community," and a specific prohibition on hydrogen sulfide emissions in such quantities that would result in a hydrogen sulfide concentration in excess of 0.03 parts per million by volume "at any occupied place beyond the premises on which the source is located." In other words, the

regulations do not prohibit odors from moving off the refinery site unless those odors would be bothersome to the refinery's neighbors. The dispersion modeling analyses performed by the Permittee and by the Department have demonstrated that the emissions limitations included in the permit will ensure compliance with these regulations, and the permit (at Section XXIV.B.14 of Attachment "B") requires a network of ambient hydrogen sulfide monitors to ensure that off-site concentrations do not exceed allowable levels.

Impacts on Soils and Vegetation

Concerns were expressed regarding the adequacy of the Department's analysis of the impacts that the refinery's emissions will have on locally grown agricultural crops. Several of the commenters expressing this concern suggested that local, state, and federal agencies should require the applicant to perform additional research into these issues prior to issuance of the air permit. Specific concerns were raised with regard to crop losses, human food chain impacts, and danger to livestock.

Pursuant to A.A.C. R18-2-407(I)(1), an analysis of the potential impacts of air pollutant emissions on soils and vegetation was required as part of the permit application review and approval process for the refinery's air permit. As described in Section VII.B of the Technical Support Document (August 30, 2004), this analysis was performed, and it included a consultation with the Arizona Department of Game and Fish and the U.S. Fish and Wildlife Service, through which no particularly sensitive soil or vegetation resources in the project vicinity were identified. As is customary in these circumstances, the Department relied heavily on U.S. EPA guidance in conducting the soils and vegetation impact analysis. The Department also relied on the secondary National Ambient Air Quality Standards (NAAQS), which are established by U.S. EPA at levels that are protective of the public welfare, including agriculture.

None of these commenters who expressed concerns regarding the soils and vegetation impact analysis identified any specific, scientific bases for their opinions regarding the inadequacy of the Department's analysis. No information was provided that would tend to refute the Department's preliminary conclusion that the refinery's emissions and the environmental impacts of those emissions are acceptable. Nonetheless, in light of the significant value of agriculture in the Yuma County economy, and the significant number of comments on this issue, the Department has performed a supplemental review of soils and vegetation impacts. A copy of the Soils and Vegetation Impacts analysis is available upon request. The review included all air pollutants of concern, not just those covered by the regulatory requirement at A.A.C. R18-2-407(I)(1), and it specifically addressed toxic impacts on plants due to air pollutant exposure; toxic impacts on plants due to deposition of air pollutants onto soils; and human health effects due to uptake of air pollutants by food crops grown on soils near the refinery. This supplemental review confirmed the Department's preliminary conclusion: the refinery's emissions and the environmental impacts of those emissions are acceptable.

Visibility Impacts Analysis

Concerns were expressed regarding the impacts of air pollutant emissions from the refinery on visibility in the Muggins Mountains Wilderness Area.

As described in Section VII.B of the Technical Support Document, and as required by A.A.C. R18-2-407(I)(1), the applicant performed an analysis of the impairment to visibility that would occur as a result of air pollutant emissions from the refinery. The results of this analysis showed

that, if it is assumed that the all emissions units at the refinery are simultaneously operating at their maximum allowable emission rates, and that this coincides with worst-case meteorological conditions that would be expected to occur less than four days per year, a perceptible plume may exist for a typical observer when viewing the terrain with the sun in front of the observer. Under all other meteorological conditions and for all other viewing angles, but maintaining the assumption that the all emissions units at the refinery are simultaneously operating at their maximum allowable emission rates, the analysis showed that the plume would be imperceptible to the typical observer. In light of the minimal visibility impairment that would occur even under conditions consistent with the very conservative assumptions made in this analysis, the Department has concluded that any visibility impairment that may occur as a result of air pollutant emissions from the refinery will be acceptable.

Impacts on Animals

Concerns were expressed regarding the effect of air pollutant emissions from the refinery on animals in general, and animal species protected under the Endangered Species Act in particular.

As described in detail in Section VII of the Technical Support Document, the Department has performed an air quality impacts analysis using worst-case meteorological data and the maximum potential emissions from the refinery. The results of this analysis show that the emissions from the refinery will not cause or contribute to an exceedance of any National Ambient Air Quality Standard (NAAQS). The NAAQS have been established at levels that are protective of the public health and welfare and are generally viewed by the Department as being sufficiently protective of animal health. In addition, the U.S. Fish and Wildlife Service (FWS) was consulted and was provided emissions data and air quality impacts analysis results. Considering that information, the FWS concluded that no threatened or endangered species or critical habitat would be affected by the refinery project. Based on the results of the Department's analyses, and on the conclusion of the FWS, the Department has concluded that the emissions from the refinery and the environmental effects of those emissions are acceptable.

Impacts on Historic Resources

Two commenters expressed concern with regard to the refinery's impacts on historic resources, and the Butterfield Overland Stage Line in particular.

Impacts that the refinery may have on historic resources, such as those associated with land use, are not considerations in the air permit application review and approval process.

Solid Waste Disposal

Inquiries were made regarding the disposal of solid wastes from refinery operations.

The generation and disposal of solid waste are not covered by the air permit. The disposal of solid wastes from the refinery may be governed by laws and regulations implemented by the Department's Waste Programs Division.

Water Resources

Inquiries were made and concerns were expressed with regard to the effect of the refinery on water resource availability and water rates in the local area.

The Department does not have any information characterizing the effect that the refinery may have on water resource availability or water rates in Yuma County. The refinery's effects on water resource availability and water rates were not considerations in the permit application review and approval process because the Department's control technology analysis did not identify any technically feasible alternative air pollution control strategies that would have significantly more or less impact on water usage than the control technologies proposed by the Permittee.

An inquiry was made concerning the basis for a statement that the Mayor of Yuma, Lawrence K. Nelson, made regarding the refinery's effect on water supplies and water rates.

The Department does not have any information regarding the basis for the statement attributed to the Mayor. The refinery's effect on water supplies and water rates is not a consideration in the permit application review and approval process.

Groundwater Contamination

A concern was expressed regarding the possibility of groundwater contamination due to the use of methyl tertiary butyl ether (MTBE) as a gasoline additive.

The effects that a stationary source's products may have on groundwater are not a consideration in the air permit application review and approval process. Nonetheless, the Department notes that the use of MTBE as a gasoline additive was effectively banned in Arizona by the enactment of A.R.S. § 41-2122.E on May 11, 2004.

An inquiry was made regarding whether the "Waste Water Treatment Ponds" will be lined to prevent ground pollution.

The Department is unclear as to the ponds referenced in this comment. The air permit requires that the Wastewater Treatment Plant comprise only covered storage tanks; no surface impoundments or "ponds" are permitted as part of the Wastewater Treatment Plant. The refinery may include a storm water retention pond; such a pond would not be a source of air pollutant emissions and is not covered by the air permit. The design of the storm water retention pond, if built, may be governed by laws and regulations implemented by the Department's Water Quality Division.

Inquiries were made regarding the ultimate disposal of wastewater from the refinery and the possibility of groundwater contamination due to wastewater discharge.

The air permit does not cover the discharge of wastewater from the refinery. This aspect of the refinery's design and operation may be governed by laws and regulations implemented by the Department's Water Quality Division.

Proposed Route of Oil Pipeline

Concerns were expressed regarding the route of the pipeline that may be constructed to supply crude oil to the refinery.

An oil pipeline, if constructed, would not be a part of the refinery; therefore, issues related to a proposed pipeline were not considered by the Department during the permit application review and approval process.

Employment and Hiring

Inquiries were made regarding the hiring practices of the proposed refinery.

The Department does not have any information characterizing the applicant's hiring practices. The Department does not have any authority to regulate hiring practices of regulated sources, and hiring practices are not a consideration in the permit application review and approval process.

Concerns were expressed regarding the hiring practices of the proposed refinery.

The comments are acknowledged. The Department does not have any authority to regulate hiring practices of regulated sources, and hiring practices are not a consideration in the permit application review and approval process.

Concerns were expressed regarding the qualifications of the permittee's employees and the availability of an adequately trained labor pool.

The comments are acknowledged. It is anticipated that the refinery's employees will be drawn primarily from the existing population in Yuma County, and the Department has concluded that no significant impacts to air quality or related factors will occur as a result of general commercial or residential growth associated with the refinery. Except to the extent that air quality and related factors will be impacted by general commercial and residential growth associated with the proposed major stationary source, the hiring practices of regulated sources are not a consideration in the permit application review and approval process.

Terrorism/Homeland Security

Inquiries were made concerning the potential for terrorist attacks on the refinery, and specifically concerning the extent to which the Department has considered the related advisory issued by the Federal Bureau of Investigation.

National security issues in general, and threat advisories specifically, are not considered by the Department during the air quality permit application review and approval process.

Concerns were expressed regarding the feasibility of terrorists using the crude oil pipeline to transport anthrax or other weapons of mass destruction and regarding the roles of the federal Department of Homeland Security and the Arizona Office of Homeland Security in overseeing the operation of any crude oil pipeline that might serve the proposed refinery.

This permitting decision pertains only to the proposed refinery. The Department has limited authority to review the secondary impacts of the refinery in the air quality permit application review and approval process, and this authority does not extend to national security issues. The Arizona Office of Homeland Security (http://www.homelandsecurity.az.gov/) can be reached by mail or courier at 1700 West Washington, Phoenix, AZ 85007, or by telephone at (602) 542-7013.

Other Safety/Security Issues

Concerns were expressed regarding the adverse effects that a spill or emergency release at the refinery might have, particularly on the health and safety of agricultural workers at adjacent farms.

The effects of spills and emergency releases are not a consideration in the air permit application review and approval process. However, the permit does require that the refinery comply with applicable provisions of the Accidental Release Prevention regulations adopted by U.S. EPA pursuant to § 112(r) of the federal Clean Air Act. These regulations require that the facility take into consideration the proximity of residences, schools, hospitals, prisons, parks and recreational areas, and offices when developing the hazard assessment mandated by the regulations. In addition, the refinery will be required to comply with the Oil Pollution Prevention regulations adopted by U.S. EPA pursuant to the Clean Water Act and the Oil Pollution Act. These regulations require that the facility prepare and implement a Spill Prevention, Control, and Countermeasure (SPCC) Plan and a Facility Response Plan (FRP) in order to prevent and minimize the effects of oil spills.

One commenter suggested that the Department and other unspecified government officials should ensure that emergency response personnel are in place in the event of a spill or release at the refinery.

Deployment of emergency response personnel is an independent governmental function, separate from the air permit application review and approval process.

Concerns were expressed regarding the safety implications of locating building the refinery near a flight pattern for military jets.

The safety of military operations is not a consideration in the air permit review and approval process.

Concerns were expressed regarding the safety implications of building the refinery near an interstate highway and railroad tracks.

Highway and railroad safety issues are not considerations in the air permit review and approval process. However, the permit does require that the refinery comply with applicable provisions of the Accidental Release Prevention regulations adopted by U.S. EPA pursuant to § 112(r) of the federal Clean Air Act. These regulations require that the facility take into consideration the proximity of the highway and railroad tracks in developing and implementing the hazard assessment, management system, prevention program, and emergency response program mandated by the regulations.

Concerns were expressed regarding the safety of workers at the refinery.

The safety of workers is not a consideration in the air permit review and approval process. Worker safety issues are under the jurisdiction of the Arizona Division of Occupational Safety and Health (http://www.ica.state.az.us/ADOSH/oshatop.htm). This agency can be reached by mail or courier at 800 West Washington, Phoenix, AZ 85007, or by telephone at (602) 542-5795.

One commenter expressed concern regarding the fact that the permit includes no provisions for calculating emissions "caused by explosions, fires, and those kind of mishaps" at the refinery.

The permit includes all applicable requirements pertaining to monitoring, recordkeeping, and reporting. These requirements are sufficient to provide assurance of compliance with all applicable emission limitations and standards. The permit does not include any specific provisions for calculating emissions from explosions, fires, or similar incidents because there are no applicable emission limitations or standards pertaining to these incidents. However, the permit does require that the refinery comply with applicable provisions of the Accidental Release Prevention regulations adopted by U.S. EPA pursuant to § 112(r) of the federal Clean Air Act. These regulations, codified at 40 CFR part 68, include provisions for determining the magnitude of the worst-case accidental release for each covered process.

Concerns were expressed regarding the safety implications of increased truck and rail traffic attributable to the refinery.

Highway and railroad safety issues are not considerations in the air permit application review and approval process.

Concerns were expressed regarding the safety implications of transporting crude oil by pipeline.

Pipeline safety issues are not considerations in the air permit application review and approval process.

An inquiry was made concerning the extent to which the State of Arizona would be accountable in the event that the people of Wellton experience adverse health or safety effects due to a fire or explosion at the refinery.

Liability issues are not a consideration in the air permit application review and approval process.

Economic Impacts on Other Parties

Concerns were expressed regarding the effect of the proposed refinery on residential real estate resale values and rental rates in the local area.

The Department does not have any information characterizing residential real estate resale values in Yuma County or the effect that the refinery may have. The refinery's effect on real estate values is not a consideration in the permit application review and approval process.

Concerns were expressed regarding the effect of the proposed refinery on businesses in the local area.

The refinery's effects on nearby businesses are not a consideration in the permit application review and approval process, except to the extent that those effects are associated with specific impacts that are addressed in the air quality regulations, such as impacts on agricultural crops and soils used for agricultural crop production. Comments concerning these specifically

enumerated impacts are addressed elsewhere, such as under the heading "Impacts on Soils and Vegetation" above.

Concerns were expressed that the owners of commercially farmed land adjacent to the refinery will suffer economic losses due to the perception of crop contamination from the refinery.

The comment is acknowledged. The effects of a proposed major stationary source on the value of neighboring property are not a consideration in the permit application review and approval process.

Inquiries were made regarding the local availability of fuels produced by the proposed refinery and the effect of the refinery on local fuel prices.

The Department does not have any information characterizing the planned geographical distribution of fuels produced at the proposed refinery, or the effect on fuel prices, as these are not considerations in the permit application review and approval process. The permit does include provisions for loading of gasoline and other fuels into tank trucks, which would typically be used for distribution of fuel products within the local market.

Future Expansion

Concerns were expressed regarding the possibility of future expansion of the refinery.

The applicant has submitted an application for a permit to construct and operate a petroleum refinery comprising various emission units and other equipment. This permit application included information indicating the capacity of various emission units, and this information was an important part of the Department's permit application review and approval process. The air permit only authorizes the construction and operation of a refinery consistent with the terms of the permit and the representations made in the permit application. While the permit does not authorize any future expansion, neither does it prohibit any future expansion. Any proposed changes that would be inconsistent with the terms of the current permit, including an expansion of the refinery, would start the permit application review process anew.

The Prevention of Significant Deterioration permitting program under the federal Clean Air Act mandates that the permit application review and approval process occur within a reasonable time before the permitted facility commences construction and operation. The Department considers this to be an important aspect of the program, for two reasons. First, this requires that the source be built with the current "Best Available Control Technology" or "BACT," not the technology that represented BACT when the permit was issued many years earlier. Second, this requires that the expansion of the source be preceded by an air quality impacts analysis that takes into account the current air quality, not the air quality that existed when the permit was issued many years earlier.

Industry-Wide Compliance History

Concerns were expressed regarding the petroleum refining industry's compliance history with respect to air pollution control laws.

The comments are acknowledged. The compliance history of other sources within the same industry is not a consideration in the permit application review and approval process.

The Department notes that the air permit for the Arizona Clean Fuels Yuma refinery contains testing, monitoring, recordkeeping, and reporting requirements that are sufficient to ensure continuous compliance with the permit's emission limits and other terms. Also, the Department projects that it will have, upon startup of the refinery, at least three employees dedicated to enforcement of the refinery's air permit.

Concerns were expressed regarding the performance of U.S. EPA in enforcing the provisions of judicial consent decrees that the United States has entered into with companies that own and operate petroleum refineries.

The comments are acknowledged. The enforcement policies of federal agencies are not a consideration in the permit application review and approval process. The Department notes that there are no existing petroleum refineries in Arizona, and the U.S. EPA Inspector General's report does not pertain to any facilities in Arizona. (See, Evaluation Report: EPA Needs to Improve Tracking of National Petroleum Refinery Compliance Program Progress and Impacts. EPA 2004-P-00021. June 22, 2004.)

Federal Oversight

One commenter expressed concern regarding whether the Department has an arm's-length relationship with the applicant and suggested that a federal regulatory agency should have oversight of the refinery.

The Department does, in fact, have an arm's-length relationship with Arizona Clean Fuels Yuma LLC. Nonetheless, the commenter will be pleased to hear that the U.S. EPA will have oversight and enforcement authority over the refinery pursuant to §§ 113 and 167 of the federal Clean Air Act.

One commenter expressed concern regarding the role of the U.S. EPA in this permitting action.

The U.S. EPA will have the opportunity to review and either approve or disapprove the Department's proposed permit decision pursuant to A.A.C. R18-2-307 and § 505 of the federal Clean Air Act. If the final permit is issued, the U.S. EPA will have oversight and enforcement authority over the refinery pursuant to §§ 113 and 167 of the federal Clean Air Act.

Draft Permit General Provisions

One commenter suggested that the affirmative defense for emissions in excess of an applicable emission limitation due to malfunction should not be granted to the permittee unless the permittee has promptly notified the general public of the excess emissions.

The affirmative defense provisions stipulated at Condition XII.E in Attachment "A" of the permit are provided by A.A.C. R18-2-310. These regulatory provisions cannot be altered through the air permit application review and approval process.

One commenter suggested that the permittee should be required, in the event that he finds that incorrect or incomplete information has been submitted to the Department, to provide an explanation of why the incorrect or incomplete information was submitted.

The requirements of Condition XV.B in Attachment "A" of the permit implement the provisions of A.A.C. R18-2-304.G. These regulatory provisions require that the permittee submit supplementary or corrected information if he finds that incorrect or incomplete information was submitted in the permit application. This provision complements the requirement that the responsible official certify the truth, accuracy, and completeness of the permit application and all submittals required by the air permit. In addition, pursuant to A.A.C. R18-2-321.A.1 and Condition III.B. in Attachment "A" of the permit, the Department is obligated to reopen and revise the permit if the permit is found to contain a material mistake or if inaccurate statements were made in establishing the terms or conditions of the permit. In the event that the Department receives corrected or supplementary information from the permittee pursuant to Condition XV.B in Attachment "A" of the permit, the Department will consider all of these regulatory requirements and will evaluate the substance of the information when determining the appropriate course of action.

One commenter expressed concern with the requirement that the permittee submit to the Department a compliance schedule within 21 days if there are excess emissions or permit deviations that cannot be corrected within 72 hours.

Condition XII.A of Attachment "A" of the permit requires the Permittee to notify the Department within 24 hours of the time that he first learns that excess emissions event has occurred, and also requires the Permittee to submit a written notification to the Department documenting and reporting the company's non-compliance with the emission limitations in the permit, within 72 hours of the company's discovery of that excess emissions event. The permit requires that the written notification include a reason for the excess emissions event and identify whether or not the event is on-going or a one-time exceedance. In the case of on-going events, the permit is structured in such a fashion as to compel the company to take corrective action, to continue submitting excess emissions reports, and ultimately stop the excess emissions from occurring. Condition XII.B of Attachment "A" of the permit provides similar requirements for permit deviations that do not involve excess emissions. If the Permittee fails to take timely corrective action, the Department can take an enforcement action and, pursuant to A.R.S. § 49-463.A, can seek civil penalties of up to $10,000 per day, per violation.

The requirements of Condition XII.D in Attachment "A" of the permit implement the provisions of A.R.S. § 49-426.I.5. These statutory provisions require that the permit include all terms that are necessary to assure compliance with all applicable requirements. In order to administer this requirement effectively, the Department requires that the refinery (and all major sources), in the event that an excess emissions event cannot be corrected within 72 hours of the discovery of the event, submit what is called a compliance schedule within 21 calendar days. This is an enforceable schedule for bringing the facility back into compliance with the rules and regulations. The Department recognizes that, depending on the complexity of the source, it takes time to develop a compliance plan. However, since the compliance schedule does authorize the violation of permit limitations, it is in the best interest of the company to come back into compliance as soon as possible, as the company remains exposed to a potential enforcement action that could include civil penalties or injunctive relief.

One commenter expressed concern regarding a lack of clarity in the permit provision for maintaining records in an "unchangeable electronic format" and suggested that a chain of custody should be required for all records.

The requirements of Condition XIII in Attachment "A" of the permit implement the provisions of A.A.C. R18-2-306.A.4. These regulatory provisions require that the permit include general requirements for recordkeeping, including a requirement for retaining records of all required monitoring data and support information for at least five years. In order to administer this requirement effectively, the Department requires that the refinery (and all major sources) maintain these records "either in an unchangeable electronic format or in a handwritten logbook utilizing indelible ink," even though the rule does not specifically include this requirement. The Department recognizes that no record is entirely unchangeable, including those that are made using indelible ink, and that there are no insurmountable methods of preventing the falsification of records. Still, in order to provide flexibility to regulated sources, the Department does not prescribe the precise format in which records required by the permit must be maintained. The Department has concluded that Condition XIII in Attachment "A" of the permit, including the requirements for maintaining records for five years and for certifying all reports of required monitoring as to their truth, accuracy, and completeness, provides adequate assurance of the representativeness of monitoring records.

Enforcement Issues

Concerns were expressed regarding ADEQ's enforcement policies and the qualifications and capabilities of its enforcement personnel.

The Department understands that the focus of these concerns was that the Department has no experience regulating petroleum refineries. The Department's analysis has determined that three additional enforcement personnel will be required in order for the Department to adequately regulate the Arizona Clean Fuels facility. The Department will have these personnel in place and trained by the time that the refinery has been constructed. The Department will work with other state and local agencies that have experience regulating petroleum refineries in order to train the enforcement personnel who will oversee the refinery operations.

Inquiries were made regarding the circumstances under which the refinery would be forced to shut down due to environmental concerns.

Under A.R.S. §§ 49-461 and 462, ADEQ has the ability to issue abatement orders or request that the attorney general file a court action requiring the facility to comply with the law. These orders and court actions can result in shutting down a facility that is creating an imminent and substantial endangerment to the public health or the environment. The Department has additional authority to seek civil penalties of up to $10,000 per day for permit violations, in accordance with A.R.S. § 49-463. Certain air quality violations also constitute felonies.

Concerns were expressed regarding the monetary penalties to which the Permittee will be subject for violations of the emission limitations and standards contained in the permit.

Pursuant to A.R.S. § 49-463, the Permittee is subject to civil penalties of up to $10,000 per day per violation. Additional remedies are also provided by state law, including injunctive relief pursuant to A.R.S. § 49-462, and by federal law.

Support for Permit Issuance
Support was expressed for issuance of the air permit.

The comments are acknowledged.

Miscellaneous Comments
One commenter inquired as to how the gasoline from this refinery would be "cleaner" than other gasoline.

The composition and specifications of the fuels produced at the refinery are not factors in the permit application review and approval process. However, the Department anticipates that the refinery will produce gasoline that will conform to applicable federal gasoline specifications pursuant to 40 CFR 80 subpart D, Arizona Clean Burning Gasoline specifications pursuant to A.A.C. R20-2-751, and California gasoline specifications pursuant to 13 CCR § 2260 et seq. These specifications govern several different properties in gasoline, including volatility, sulfur content, and benzene content. The effects of these specifications are many, including a reduction in evaporative VOC and benzene emissions; a reduction in sulfur oxides emissions due to reduced fuel sulfur content; and reductions in emissions of several pollutants due to enhanced performance of emission control systems in the presence of lower-sulfur fuels.

One commenter inquired as to whether the refinery will produce "biodiesel" (Diesel fuel made from renewable resources such as vegetable oils) and suggested that to do so may be economically advantageous to the facility in the future.

The refinery will use only petroleum-based raw materials, primarily including crude oil, natural gas, and natural gasoline. This is a fundamental aspect of the stationary source for which a permit application was submitted, and redesign or revision of this aspect is beyond the purview of the Department.

One commenter inquired, with regard to the Benzene Reduction Unit at the refinery, "Where does the benzene go?"

Benzene (C6H6) is reacted with hydrogen, or "saturated," to form naphthenes such as cyclohexane (C6H12). The product material from the benzene reduction unit is a component of the refinery's gasoline product.

An inquiry was made regarding the effect of air pollutant emissions from the refinery on water in the irrigation canal.

The Department recognizes that deposition of air pollutants into bodies of water, including the Mohawk Canal adjacent to the site of the refinery, will increase by negligible amounts as a result of the construction and operation of the refinery.

As described in Section VII.A of the Technical Support Document (August 30, 2004), the Department has performed an air quality impacts analysis using the most representative available meteorological data from the National Weather Service in conjunction with the maximum potential emissions from the refinery. The results of this analysis show that the emissions from

the refinery will not cause or contribute to an exceedance of any National Ambient Air Quality Standard (NAAQS). This includes the secondary NAAQS, which are established by U.S. EPA at levels that are protective of the public welfare. The Department notes that U.S. EPA's considerations in setting secondary NAAQS include possible effects on aquatic systems through mechanisms such as acidification and eutrophication and, for particulate matter especially, also include effects of trace organic and inorganic compounds. For these reasons, and based on the results of the air quality impacts analysis, the Department has concluded that the emissions from the refinery and the environmental effects of those emissions are acceptable.

One commenter expressed concern that a decision to issue the air permit for the refinery would result in Arizona becoming "an oil refining state," with associated impacts on public health and tourism.

The Department recognizes that there are currently no petroleum refineries in Arizona and that the proposed refinery would be the first to operate in this state since 1994. These facts were not considered by the Department in the permit application review and approval process. The public health impacts of this particular refinery were considered and addressed through the Air Quality Impacts Analysis; however, the public health impacts of Arizona being an "oil refining state" in general were not considered in the permit application review and approval process, as these would be inappropriate considerations in the decision-making process for a major stationary source permit application.

One commenter expressed concern that a decision to issue the air permit for the refinery would result in the southwestern United States and adjoining areas in northern Mexico becoming "a major oil transportation, shipping, and processing area," with associated impacts on public health, economies, and the environment.

According to the Energy Information Administration within the U.S. Department of Energy, as of January 2004, there are 149 petroleum refineries in the United States, with a total crude oil distillation capacity of 18 million barrels per day. Only two percent of this capacity (11 refineries with a total capacity of 370,000 barrels per day) is located in the five southwestern states of Arizona, Nevada, New Mexico, and Utah. If the proposed refinery becomes operational, the percentage of U.S. refining capacity located in the southwest will increase to three percent. The Department does not agree that it would then be appropriate to characterize this region as a major oil refining area.

Nonetheless, the Department did not consider the role of oil transportation, shipping, and refining in the overall economy of the southwestern U.S. and northern Mexico in the permit application review and approval process. Similarly, the Department did not consider the environmental and public health impacts of the oil transportation, shipping, and refining industries within this region, except to the extent that those impacts are directly related to the air pollutant emissions from this particular refinery.

One commenter suggested that the applicant should be required to perform a study that would identify any positive environmental impacts that may occur as a result of the issuance of the air permit for the refinery.

If the Department concludes that a proposed major stationary source will comply with all applicable air quality laws and regulations, as is the case with the proposed refinery, the Department is legally obligated to issue the air permit for the proposed facility. The existence of positive environmental impacts is not a consideration in the air permit application review and approval process.

Concerns were expressed with regard to the refinery proponents' characterization of the refinery's emissions.

The concerns are noted. The accuracy and appropriateness of public statements made by a project's proponents or by its critics are not a consideration in the permit application review and approval process.

One commenter expressed concern that the refinery will have excess emissions during "upset events" such as "malfunctions, excess emissions episodes, breakdowns, power dips, power surges, power failures, lightning strikes, human errors, mechanical failures, etc." The commenter also asserted that the permit does not place limits on the number of these upset events, the duration of each upset event, or the emissions during upset events.

To the extent that events described by the commenter might result in emissions in excess of any applicable emission limitation or standard, those upset events and excess emissions are covered by Section XII of Attachment "A" to the refinery's air permit. By definition, these excess emissions events constitute permit deviations, and do not go unregulated. All permit deviations are required to be reported to the Department within two working days of the time that the deviation occurred, as stated in Condition XII.B of Attachment "A". This report is required to include the information regarding the probable cause of the deviations, and any corrective actions or preventative measures that were taken by the source in order to mitigate the deviation.

According to Section XII of Attachment "A", emissions in excess of applicable emissions limitations due to malfunction, startup or shutdown shall constitute a violation of the permit. The conditions of this Section of the permit do provide the source with an affirmative defense against civil or administrative enforcement that might proceed from such a violation, but only if the permittee complies with the reporting requirements in Section XII, and has successfully demonstrated the following:

For Malfunctions:

1. The excess emissions resulted from a sudden and unavoidable breakdown of process equipment, or air pollution control equipment beyond the reasonable control of the operator;
2. The air pollution control equipment, process equipment or processes were at all times maintained and operated in a manner consistent with good practice for minimizing emissions;
3. If repairs were required, the repairs were made in an expeditious fashion when the applicable emission limitations were being exceeded. This could include the use of off-shift labor and overtime, unless the permittee can prove that such measures were impracticable;

4. The amount and duration of the excess emissions (including any bypass operation) were minimized to the maximum extent practicable during the emissions event;
5. All reasonable steps were taken to minimize the impact of the excess emissions on ambient air quality;
6. The excess emissions were not part of a recurring pattern that is indicative of inadequate design, operation, or maintenance;
7. There were no exceedances of the relevant National Ambient Air Quality Standards that could be attributed to the emitting source;
8. The excess emissions did not stem from any activity or event that could have been reasonably forseen and avoided, or planned, and could not have been avoided by better operations and maintenance practices;
9. All emissions monitoring systems were kept in operation if at all practicable; and
10. The permittee's actions in response to the excess emissions event were documented by contemporaneous records.

For Start-up and Shutdown:

1. The excess emissions could not have been prevented through careful and prudent planning and design;
2. If the excess emissions were the result of a bypass of control equipment, the bypass was unavoidable to prevent the loss of life, personal injury, or sever damage to air pollution control equipment, production equipment or other property;
3. The permittee's air pollution control equipment, process equipment or processes were at all times maintained and operated in a manner consistent with good practice for minimizing emissions;
4. The amount and duration of the excess emissions (including bypass operations) were minimized to the maximum extent practicable during periods of such emissions;
5. All reasonable steps were taken to minimize the impacts of the excess emissions on ambient air quality;
6. During the period of excess emissions there were no exceedances of the relevant National Ambient Air Quality Standards that could be attributed to the source;
7. All emissions monitoring systems were kept in operation if at all practicable; and
8. The permittee's actions in response to the excess emissions event were documented by contemporaneous records.

Upon receipt of any permit deviation report, the Technical Services Unit of the Air Quality Compliance Section will review the report and supporting information. If the permittee fails to prove that it has an affirmative defense for the excess emissions event, or if it is determined that the excess emissions event does not qualify for affirmative defense, the Air Quality Compliance Section will follow the guidelines set forth in the Department's Compliance and Enforcement Handbook to ensure that the appropriate actions are taken against the permittee for violating the conditions of its permit.